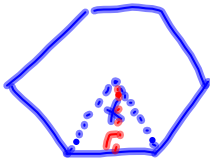


Area and perimeter

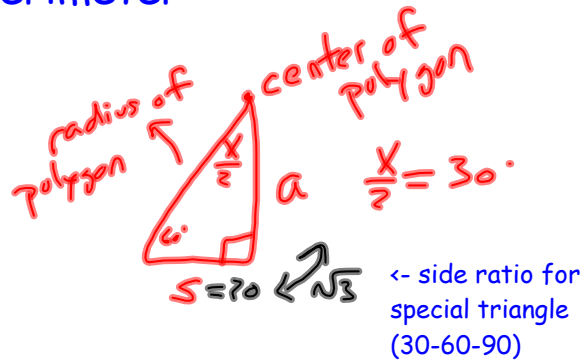
Hexagon



$$\frac{360}{n} = \text{central angle} = x$$

n = number of sides

$$\frac{360}{6} = 60^\circ = x$$



$$P = 240 \text{ mm}$$

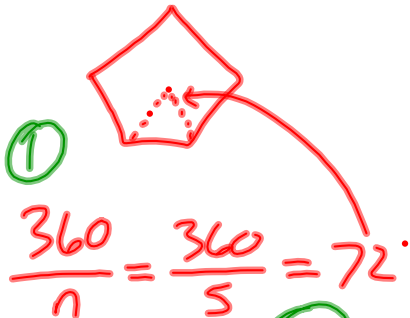
$$P/6 = \text{side} = 40 \text{ mm}$$

$$s = \frac{1}{2} \text{ side} = 20 \text{ mm}$$

$$a = s \cdot \sqrt{3} = 20\sqrt{3}$$

$$\text{Area} = \frac{1}{2} a \cdot P = \frac{1}{2} (20\sqrt{3}) (240) = 2400\sqrt{3}$$

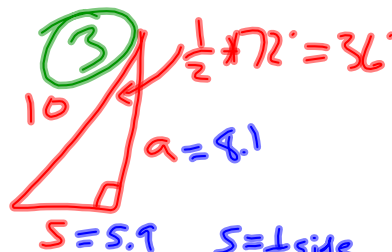
Pentagon



$$\frac{360}{n} = \frac{360}{5} = 72^\circ$$

$$\text{Radius} = 10 \text{ mm}$$

$$P = \text{side} \cdot n$$



$$\sin = \frac{\text{opp}}{\text{hyp}}$$

$$\sin(36^\circ) = \frac{s}{10}$$

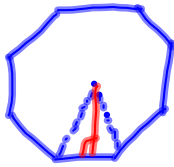
$$10 \cdot \sin(36^\circ) = s = 5.9$$

$$\cos(36^\circ) = \frac{a}{10}$$

$$10 \cdot \cos(36^\circ) = a = 8.1$$

$$A = \frac{1}{2} a \cdot P = \frac{1}{2} (8.1)(59) = 239 \text{ mm}^2$$

Hexagon <- Given



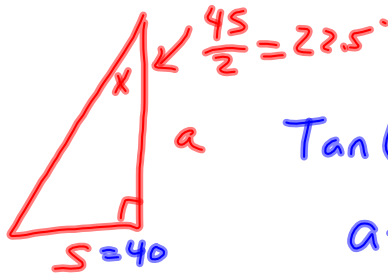
$$P = 640 \text{ mm} \quad \leftarrow \text{Given}$$

$$n = 6$$

$$\frac{360}{n} = \frac{360}{6} = 60^\circ$$

$$\text{Side} = \frac{640}{6} = 106.67 \text{ mm}$$

$$S = \frac{1}{2} \text{ side} = 53.33 \text{ mm}$$



$$\tan(30^\circ) = \frac{S}{a}$$

$$a = \frac{S}{\tan(30^\circ)} = \frac{53.33}{\tan(30^\circ)} = 92.38 \text{ mm}$$

SOH
CAH
TOA

$$A = \frac{1}{2} a * P$$

$$= \frac{1}{2} (92.38) (640)$$

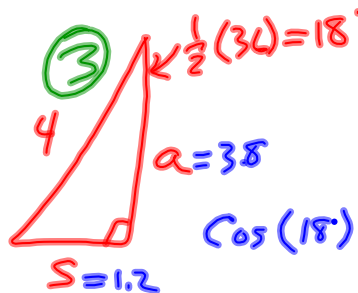
$$= 29561.6 \text{ mm}^2$$

① Decagon = 10 sided = n

$$\text{Radius} = 4$$

② Central Angle

$$\frac{360}{n} = \frac{360}{10} = 36^\circ$$



$$\cos(18^\circ) = \frac{S}{4}$$

$$4 * \cos(18^\circ) = S = 3.8$$

$$\sin(18^\circ) = \frac{x}{4}$$

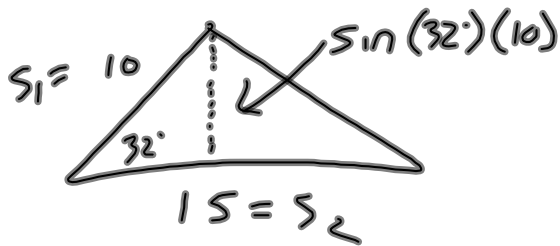
$$4 * \sin(18^\circ) = x = 1.2$$

$$\text{Side} = 2x = 2.4$$

$$P = 2.4 * 10 = 24$$

$$A = \frac{1}{2} a * P = \frac{1}{2} (3.8) (24) = 45.6 \text{ sq. units}$$

Area of a triangle shortcut



$$A = \frac{1}{2} b h$$

$$A = \frac{1}{2} * S_1 * S_2 * \sin(32)$$

$$\text{Area} = \frac{1}{2} * (\text{side}_1) * (\text{side}_2) * (\sin(\text{angle between}))$$

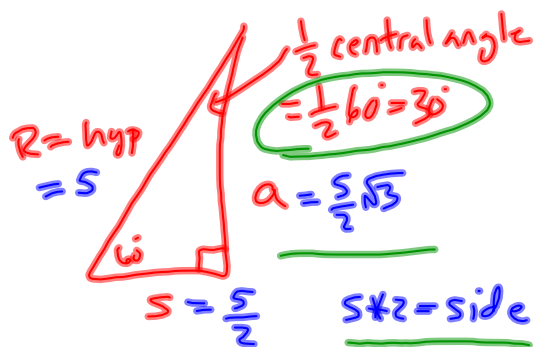


$$n = 6$$

Central Angle

$$\frac{360}{n} = \frac{360}{6} = 60^\circ$$

$$\boxed{\text{Radius} = S}$$



$$P = n * \text{side} = 6 * S = 30$$

$$\boxed{A = \frac{1}{2} a * P}$$

$$A = \frac{1}{2} \left(\frac{S}{2} \sqrt{3} \right) (30) \approx 65 \text{ sq units}$$

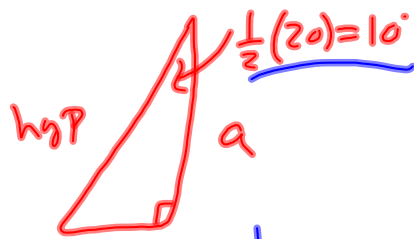
①

18-gon

$$P = 72 \leftarrow$$

Central Angle

$$\textcircled{2} \frac{360}{n} = \frac{360}{18} = 20^\circ$$



$$s \rightarrow \frac{1}{2} \text{ side} = \frac{1}{2} \left(\frac{72}{18} \right) = \frac{1}{2} (4)$$

SOH ←

CAH ←

TOA

$$s = 2 \textcircled{3}$$

$$\tan = \frac{\text{opp}}{\text{adj}} = \frac{2}{a} \textcircled{4}$$

$$\tan(10^\circ) = \frac{2}{a}$$

$$a = \frac{2}{\tan(10^\circ)} \approx 11.3$$

$$\textcircled{5} A = \frac{1}{2} a * P$$

$$= \frac{1}{2} (11.3)(72) = 407 \text{ sq units}$$

$$A = \frac{1}{2} a * P \textcircled{6} = \frac{1}{2} (5.7)(41) = 116.85$$

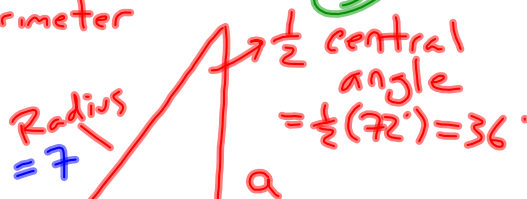
apothem

perimeter

①



Radius = 7



$$\cos(36^\circ) = \frac{a}{7} \textcircled{4}$$

$$7 * \cos(36^\circ) = a \approx 5.7$$

$$\sin(36^\circ) = \frac{s}{7}$$

$$7 * \sin(36^\circ) = s \approx 4.1 \textcircled{5}$$

$$\text{Side} = 2 * s = 2 * 4.1 = 8.2$$

$$P = 5(8.2) = 41$$

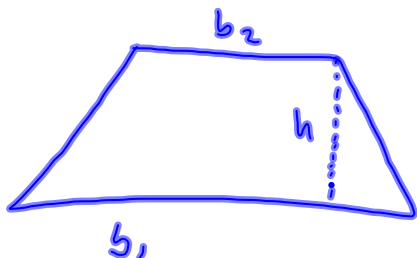
① Central Angle

$$\frac{360}{n} = \frac{360}{5} = 72^\circ$$

$$\text{Radius} = 7$$

Trapezoid

$$A = \frac{1}{2} h (b_1 + b_2)$$



If $b_1 = 5$

$b_2 = 7$

$h = 4$

Then $A = \frac{1}{2} (4)(5+7)$
 $= 24$

If $b_1 = 6$

$b_2 = 14$

$h = 7$

Then $A = \frac{1}{2} (7)(6+14)$
 $= 70$